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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/696,269	10/24/2000	Jack A. Mobley	23060	4377

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EXAMINER

BATAILLE, PIERRE MICHE

ART UNIT PAPER NUMBER

2186

DATE MAILED: 09/05/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/696,269

Applicant(s)

MOBLEY ET AL.

Examiner

Pierre-Michel Bataille

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 May 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Correspondence

1. This Office Action is taken in response to Applicant's filed application on October 23, 2000, in which claims 1-14 are pending.
2. The Office acknowledges the filing of Information Disclosure Statement (IDS) filed October 23, 2000, which have been considered by the examiner.
3. The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. The following objection is observed:

Claim 11 recited a disc drive dependent upon claim 1; however, claim 1 recited a method. The claim's dependency should be changed to claims, 7, 8, 9 or 10 for consistency.

Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claim 12 is rejected under 35 U.S.C. 102(b) as being anticipated by US 5,729,718 (Au).

With respect to claim 12, Au teaches a system for determining lead time latency as function of head switch, seek, and rotational latencies and utilizing embedded disk drive controller for command queue reordering of a disk drive unit comprising: a plurality of heads adjacent to a corresponding plurality of recording surfaces on which a plurality of concentric data tracks are respectively defined so that the tracks on the recording surfaces at each given radius make up a cylinder [Col. 2, Line 66 to Col. 3, Line 7]; and means for scheduling a plurality of pending access commands from a host computer to access a corresponding plurality of destination tracks on different recording surfaces each having an associated target head different from a presently active head [control unit, Col. 3, Lines 8-14], by determining a corrected seek time for each of the pending access commands which accounts for radial positional offset between the presently active head and the associated target head [Col. 3, Lines 48-66; Col. 4, Lines 36-57].

6. Claim 12 is rejected under 35 U.S.C. 102(b) as being anticipated by US 5,854,941 (Ballard et al).

With respect to claim 12, Ballard teaches a system for determining lead time latency as function of head switch, seek, and rotational latencies and utilizing embedded disk drive controller for command queue reordering of a disk drive unit comprising: a plurality of heads adjacent to a corresponding plurality of recording surfaces on which a plurality of concentric data tracks are respectively defined so that

the tracks on the recording surfaces at each given radius make up a cylinder; and means for scheduling a plurality of pending access commands from a host computer to access a corresponding plurality of destination tracks on different recording surfaces each having an associated target head different from a presently active head, by determining a corrected seek time for each of the pending access commands which accounts for radial positional offset between the presently active head and the associated target head [Col. 3, Lines 34-49; Col. 4, Lines 39-66 Col. 8, Line 30 to Col. 9, Line 38].

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-11 and 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 5,729,718 (Au) in view of US 5,854,941 (Ballard et al).

With respect to claims 1, 7, 13 and 14, Au teaches a system for determining lead time latency as function of head switch, seek, and rotational latencies and utilizing embedded disk drive controller for command queue reordering of a disk drive unit comprising: a plurality of heads adjacent to a corresponding plurality of recording surfaces on which a plurality of concentric data tracks are respectively defined so that the tracks on the recording surfaces at each given radius make up a cylinder [Col. 2, Line 66 to Col. 3, Line 7]; and means for scheduling a plurality of pending access

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commands from a host computer to access a corresponding plurality of destination tracks on different recording surfaces each having an associated target head different from a presently active head [control unit, Col. 3, Lines 8-14], by determining a corrected seek time for each of the pending access commands which accounts for radial positional offset between the presently active head and the associated target head [Col. 3, Lines 48-66; Col. 4, Lines 36-57].

Au additionally teaches scheduling execution of pending access commands in relation to corrected seek time determining in relation with estimated seek length as a radial distance between an initial cylinder and a destination cylinder (Δ cylinder), a radial position offset value between the presently active head and the associated target head (Δ head); and identifying an estimated seek distance comprising a radial distance between an initial track and a destination track to which the associated target head is to be moved (Δ sector) [Col. 4, Lines 16-56]. However, Au fail to teach a table for estimated seek time by seek length. Meanwhile, Ballard, in the same field of endeavor, teaches determining a corrected seek time for each of the pending access commands which accounts for radial positional offset between the presently active head and the associated target head [Col. 3, Lines 34-49] and a table for estimated seek time by seek length [Col. 3, Lines 50-62; Col. 4, Lines 39-66; Col. 8, Line 30 to Col. 9, Line 38].

Therefore, it would have been obvious to one having ordinary skill in the art and having both disclosures before him at the time of the invention to combine the scheduling process taught by Au with the table of estimated seek times by seek length, as taught by Ballard, because hard disk I/O average access time would have been

improved by estimating access time for pending I/O requests and selecting the request with the lowest access time as the next request to be processed where a current I/O request is being processed and pending requests are to be processed, as taught by Ballard [Col. 3, Lines 7-12].

With respect to claims 2-4, 8 and 11, Au teaches measured positional offset rounding the corrected seek distance to the nearest whole number of tracks and executing a seek to place the target head over the destination track [Col. 3, Lines 48-66; Col. 4, Lines 36-57]; Ballard additionally teaches storing a the measured positional offset in a head offset table in memory accessible by control processor, rounding the corrected seek distance to the nearest whole number of tracks and executing a seek to place the target head over the destination track [Col. 3, Lines 50-62; Col. 4, Lines 39-66; Col. 8, Line 30 to Col. 9, Line 38].

With respect to claims 5-6 and 9-10, Au teaches applying current (typical feature in disk drive access) to an actuator motor to move the presently active head to a final cylinder and performing a head switch to switch the target head so that the target head transduces servo data from associated recording surface [Col. 8, Lines 1-10; Col. 6, Lines 40-54]; Ballard additionally teaches applying current (typical feature in disk drive access) to an actuator motor to move the presently active head to a final cylinder and performing a head switch to switch the target head so that the target head transduces servo data from associated recording surface [Col. 4, Lines 28-67; Col. 8, Lines 47-67].

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US 6,604,178 (hall) teaching hard disk drive employing neural network for performing expected access time calculations.

US 6,574,676 (Megiddo) teaching system and method for scheduling disk drive commands by expected total access time.

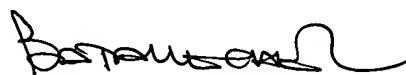
US 6,195,222 (Heminger et al) teaching disk drive with seek profile selection based on a queued environment.

"DASD Command Reordering Algorithm That Accounts for Tangential Position", IBM Technical Disclosure, Vol. 42, Issue 413, September 1, 1998.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pierre-Michel Bataille whose telephone number is (703) 305-0134. The examiner can normally be reached on Tue-Fri (7:30A to 6:00P).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew M. Kim can be reached on (703) 305-3821. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.



Pierre Michel Bataille
Examiner
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